BIRDS RECORDED DURING SEVEN EXPEDITIONS TO LADAKH FROM 1997 TO 2003[1]

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The consolidated results of seven ornithological expeditions to Ladakh, Indian Trans-Himalayas during summers of 1998, 1999, 2001, 2002, 2003 and autumns of 1997, 2000 are documented with information on habitat, abundance, distribution and status. Interesting sightings and observations are presented in greater detail together with records from previous studies of the area. A total of 122 bird species were recorded including four new records for the area. The adverse impact of tourism, overgrazing and other factors on the fragile ecosystem of this remote area are discussed and recommendations made for protection of the habitat for pregnable, endemic bird species.

Key words: Ladakh, ornithological expeditions, new records, avifauna

INTRODUCTION

Summer and Autumn surveys of raptors were conducted in collaboration with the Indian Army from 1997 to 2003. The main objective of the surveys was to collect distribution and breeding data on raptors and list all other bird species in Ladakh. Although Ladakh is remote and logistically one of the most difficult areas to work in, it has attracted many ornithologists after 1976 when travel restrictions were relaxed. Subsequently, most studies have focused on the 'vulnerable' Black-necked Crane *Grus nigricollis*. Sálim Ali guided a joint Bombay Natural History Society (BNHS) and World Wide Fund for Nature (WWF) expedition to Ladakh in 1976 in search of the crane, which led to a four-year study (Hussain 1976). The project aimed at rediscovering its breeding grounds, through short-term missions to Ladakh, and monitoring its breeding success. In 1986, a follow up expedition was organized by the BNHS to observe the status of the Black-necked Crane (Ali *et al.* 1986). Otto Pfister studied the Black-necked Crane from 1994 to 1997 (Pfister 1998 and 2001) in addition to general mammal/bird surveys. Migration studies, conducted by Southampton University between 1977-82, were mainly concentrated in the Suru valley and Shey-Tikse marshes (William and Delany 1985, 1986). WWF initiated a project in 1999 for the "Conservation of High Altitude Wetlands of Ladakh" (Chatterjee *et al.* 2002).

Our yearly surveys over seven years during summer were conducted during July 1999, June/July 2001 and August 2002 (HS and RKN) and May/June 1998 (RKN) and June/July 2003 (RKN and others); during autumn in September 1997 (RKN and others) and August 2000 (RKN and HS). The duration of the surveys was three to four weeks except in 2002, which lasted two weeks. During these expeditions a total of 122 bird species were recorded, of which four had not been reported earlier for the Ladakh region: Little Grebe *Tachybaptus ruficollis*, Little Cormorant *Phalacrocorax niger*, Large Pied Wagtail *Motacilla maderaspatensis* and Rufous-necked Snowfinch *Pyrgilauda ruficollis*. Little Grebe, Large Pied Wagtail, Small Blue Kingfisher *Alcedo atthis* and House Crow *Corvus splendens* were recorded at considerably higher elevations than previously reported in the Indian subcontinent. The breeding of Upland Buzzard *Buteo hemilasius* was confirmed – first for the Indian subcontinent (Naoroji and Forsman 2001).

Geographical description of the area

Ladakh is a cold desert situated in the westernmost Trans-Himalayan region of India representing the westernmost extremity of the Tibetan Plateau. Ladakh has close ecological and cultural affinities with Tibet and was included in the "Outer Plateau" area of Tibet by Charles Vaurie (1972) who studied the birds of Tibet. Ladakh is extremely arid, rugged and mountainous receiving less rainfall than eastern Tibet. The 100,000 sq. km area of Ladakh is bordered by the Karakoram range in the north and by the main Himalayan range in the south, the Ladakh and Zanskar ranges running between and parallel to these main mountain ranges. From its source on the Tibetan Plateau, the Indus river flows northwest between the Zanskar and Ladakh ranges, turning southward 300 km downstream into northern Pakistan. Almost all the settlements (including army and ITBP) are concentrated along the main river valleys (Nubra – Shyok, Indus, Suru, and Zanskar), each of which contains small areas of low lying, open, level ground. Eastern Ladakh has several lakes and forms the western extremity of Changthang, the northwestern adjunct of the Tibetan plateau.

Fig. 1: Map of Ladakh - Areas Surveyed

In Ladakh the altitudes range from 2700 m to 7000 m. The landscape which includes barren mountains, steep valleys, sand dunes, grasslands, upland bogs, marshes, rivers, and sweet and brackish lakes make it a land of contrasts and extremes. The temperatures are extreme with maximum and minimum temperatures ranging from 35°C in summer to minus 45°C in winter. Precipitation is less than 100 mm per year. The human population is sparse, mainly concentrated within the habitable Indus and other river valleys. The flora consists of selective elements from Afghanistan, Siberia, Tibet and the Himalayan region together with a considerable proportion of endemic species. Vegetation consists primarily of sparse grass, herbaceous plants and low thorny scrub. The combination of constant high winds, low temperatures and high altitude has a depressing effect on the vegetation.

Objectives: The objectives of the expeditions were:

a) survey all areas for raptors (status and habitat requirements) and prepare checklists of all birds observed.

b) search for nests of resident raptors and observe their breeding biology and ecology, and identify threats if any.

c) raise awareness levels of our main collaborators – the army and the forest department and suggest conservation measures.

METHODS AND STUDY AREA

Raptors and other birds were primarily recorded by employing the 'line transect' method from the vehicle or while hiking. Breeding studies and intensive surveys were conducted near nesting sites of raptors, where we camped for reasonably long periods. Birds observed were logged, photographed if possible and maximum numbers were noted to assess relative abundance. Mammals (mainly Tibetan Wild Ass *Equus kiang*) encountered were also logged.

Accessible areas along the Indus, west up to Alchi, but mainly from Leh eastwards to Shey, Tikse, Chumatang, and Loma, Rumbak, the Nubra and Tankse valleys, and especially

Rupchu and Changthang territories in the east were regularly surveyed on each visit.

Conservation significance of Ladakh

Despite the harsh environmental and climatic conditions, the avifauna of Ladakh is diverse, displaying Palaearctic, Mediterranean and Chinese influences. Each trip has stimulated us with sightings of unexpected migrants and little known high altitude species. Uniquely located on the border between the Palaearctic and Indo-Malayan zoogeographic zones, Ladakh is strongly influenced by typical species from both regions. The characteristic Tibetan species extend their ranges well into eastern Ladakh. In addition, dry and sunny summer months attract many summer visitors and breeders. These diverse climatic and geographic influences make Ladakh a melting pot of bird movements, resulting in more than 300 species recorded in the area so far (Pfister 2001).

The 'vulnerable' Black-necked Crane breeds in Ladakh. Thirteen pairs have been breeding regularly in the area, including one pair each in Tso Moriri and Tso Kar (Chatterjee *et al.* 2002). Tso Moriri is not only an important staging point for migratory birds, but also the main breeding ground of the declining Bar-headed Goose *Anser indicus* in the Indian subcontinent. The fresh water Startsapuk Tso and the saline Tso Kar have a large population of Brahminy Shelduck *Tadorna ferruginea*. Tso Moriri and Tso Kar have small breeding populations of Great Crested Grebe *Podiceps cristatus*. The Common Tern *Sterna hirundo* breeds in small numbers in the marshes around the lakes. At Tso Moriri, Common Merganser *Mergus merganser* also breeds in small numbers (Chatterjee *et al.* 2002). The Brown-headed Gull *Larus brunnicephalus* and Lesser Sand Plover *Charadrius mongolus* breed in good numbers at Tso Kar, whereas Common Redshank *Tringa totanus* breeds in small numbers in the area.

Several large mammals including those categorised by IUCN as vulnerable, critical, or endangered are found in Ladakh such as Snow Leopard *Uncia uncia*, Tibetan Wild Ass or Kiang *Equus kiang*, Siberian Ibex *Capra sibirica*, Great Tibetan Sheep Ovis *ammon*, Urial or Shapu *Ovis vignei*, Bharal or Blue Sheep *Pseudois nayaur*, Tibetan Antelope or Chiru *Pantholops hodgsonii*, Tibetan Gazelle *Procapra picticaudata*, Wild Yak *Bos grunniens*, Eurasian Lynx *Lynx lynx*, Tibetan Wolf *Canis lupus*, Indian Wild Dog *Cuon alpinus*, Red Fox *Vulpus vulpus*, and Brown Bear *Ursus arctos*.

RESULTS

During the seven surveys, a total of 122 bird species were recorded, including twelve species of birds of prey; ten diurnal and two nocturnal. Four new species were recorded from the area: Little Grebe, Little Cormorant, Large Pied Wagtail and Rufous-necked Snowfinch. The observations of Little Grebe, Large Pied Wagtail, Small Blue Kingfisher and House Crow in Ladakh increased altitudinal ranges of those species' to considerably higher elevations than previously reported. In addition, breeding of Upland Buzzard in Ladakh was documented — first record for the Indian subcontinent. One nest was found in 1998, and two nests containing near fully-fledged young were observed in 1999 (Naoroji and Forsman 2001).

Threats to the habitat and wildlife

The Ladakhis are innately life respecting people and sensitive to their environment. Traditionally they have used the natural resources of the region wisely without causing any adverse impact on the environment. However, recent changes in land use patterns, influx of tourists, settlement of Tibetan refugees at Hanle and increase in livestock, especially in Changthang, has had increasingly adverse effects on the fragile environment and consequently the wildlife even in the more remote areas (see Recommendations). For example, the Tibetan Gazelle *Procapra picticaudata* was abundant on the plateau to the southeast of Tso Moriri lake, on the hills east of Hanle, and in the Indus valley from Demchok, the frontier village of Ladakh, as far down as Nyima (Nyoma) (Sterndale 1884). In seven visits we only once sighted three Tibetan Gazelles at Hanle. The endangered Black-necked Crane, which has so far managed to survive, is increasingly becoming vulnerable to changes in land use patterns, and increase in predation of eggs and chicks by proliferating numbers of feral dogs and to a lesser extent increase of egg predation by Ravens (Pfister 1998).

The pastures are increasingly being overgrazed and consequently degraded due to considerable increase in livestock because of increased government supported commercialized production of the valuable Pashmina wool. The Changthang area of Ladakh holds about 14,000 domesticated livestock, represented mainly by sheep, goat, yak and ponies. The growing domestic livestock population has overgrazed the pastureland, causing wind erosion and desertification. Heavy pressure on available pastures have resulted in the herdsmen, known as Changpas (who earlier co-existed peacefully with wild herbivores), becoming hostile especially to the Kiang which are now being driven away from all pastureland and marshes along river valleys. The herdsmen argue that the Kiang and Tibetan Gazelle directly compete with their domestic livestock.

Domestic livestock (including ponies and yak) are furthermore herded into marshes and shallow ponds (not their natural habitat) where the vegetation is comparatively lush

and intact. At Chushul, Hanle and Lal Pahari livestock grazing in knee-deep water disturb breeding Black-necked Crane and waterfowl. The Changpas deliberately do not harm the breeding birds, but their frequent movement near nesting sites sometimes forces incubating birds to leave the clutch, allowing aerial and terrestrial predators access to their nests (Pfister 1998).

Herders are openly hostile towards the Kiang, which are driven off on horseback. Their dogs are also trained to warn them of approaching Kiang. Most grazing pastures are now fenced, effectively preventing the Kiang from feeding. Furthermore, the Changpas have ceased practising rotational grazing and are only partially nomadic, having permanent summer camps in prime pastureland (when the Black-necked Crane, Waterfowl and ungulates breed), thereby creating additional pressure on the wildlife and the land. In the near future, confrontation between the Kiang and the Changpas in Changthang could be a major conservation issue.

Throughout Ladakh shepherds are visibly hostile towards the Golden Eagle *Aquila chrysaetos*. Accessible nests are destroyed, as the species is perceived as a threat to their lambs. In fact, Buddhist values are discarded and accessible nests usually destroyed or nesting disturbed so that the adults desert the nest. Its habit of only occasionally lifting few weeks old lambs of domestic sheep and goat does not endear the species to the local population. The pressure on Golden Eagles is primarily during the summer breeding season, which coincides with the lambing period.

The large population of dogs belonging to the Changpas and adopted by soldiers at army and ITBP outposts are the biggest threat to the Black-necked Crane, ground breeding birds in general and small mammals. Dog numbers have multiplied by as many as 50 at most outposts as they are fed to provide vigilance. Egg destruction and chick mortality caused by dogs represent the biggest threat to the Black-necked Crane population in Ladakh, and are responsible for up to 50 per cent destruction of broods within a productive cycle during certain years (Pfister 1998).

The Jammu and Kashmir government and the Indian Army have improved accessibility to Ladakh, particularly the Changthang and Rupshu areas. Motorable tracks have been laid even in extremely remote areas for strategic reasons. However, road construction accompanied by blasting has not only created disturbance to wildlife but also initiated new development activities in remote areas. During our visit to Hanle in 2002, we found recently erected electricity poles cutting through the marsh. This poses a direct threat of electrocution or wings being sheared off to flying Black-necked Cranes, especially at night. The poles could have been routed along the periphery of the marsh.

Encouraging Tibetan refugees to settle at Hanle is directly creating new threats to the Changthang Wilderness area. The Tibetan refugee settlement is rapidly growing into a township with cement residential buildings, schools, dormitories and a handicraft centre, thanks to generous foreign aid. The small primitive Ladakhi settlement is, however, unchanged. The Hanle river has been diverted to newly created agriculture fields, not only reducing the area available for wildlife, but also shrinking the marsh. Unsuccessful fenced-in plantations of stunted Willow *Salix* and Poplar *Populus* are irrigated through channels diverted from the marsh. Lack of water may drastically shrink or dry up the marsh in the near future. Relatively large-scale agriculture along the marsh has also led to fencing of fields. This recent practice has reduced and fragmented primary habitat.

Ladakh has been experiencing an increasing influx of tourists since 1974. The easy availability of 'inner line' permits from the district administration in Leh has made the popular lake areas of Tso Moriri, western Pangong Tso and Tso Kar accessible since 1993. Tourism in the region is expected to rise. Surveys conducted by the World Wide Fund Nature-India (WWF) indicate that there has been an alarming increase in the number of visitors to the Changthang region (Chatterjee *et al.* 2002).

Tourists are accommodated in eco-friendly tents, as permanent infrastructure is thankfully lacking. Although tents are usually pitched in defined areas, waste management is unfortunately totally neglected and most tourist sites are littered with various non-degradable items. Additionally, at some remote army and Indo-Tibetan Border Police (ITBP) outposts degradable and non-degradable garbage is a common sight. The impact of tourism has been maximum near the major wetlands of Tso Moriri and Tso Kar.

Pastures and wetlands are the feeding and breeding areas of the Upland Buzzard, Black-necked Crane and Bar-headed Goose (*Anser indicus)*; camping in these areas, driving off track and washing of vehicles are disturbing the breeding marsh dependent birds (Chatterjee *et al.* 2002). The dramatic increases in trekkers' pack animals — donkeys, mules and horses have further degraded the pastures particularly around the wetlands accessible to tourists.

Recommendations

There is an immediate need to develop a strategy and action plan for the conservation and management of Ladakh's natural heritage, especially the high altitude wetlands and lakes throughout Changthang and Rupshu, namely Tso Moriri, Tso Kar and Nuro Sumdo. Prompt steps need to be initiated by involving all the stakeholders – local communities, tour operators, development agencies and defence forces.

Pangong Tso is comparatively pristine as it is more isolated and tourism is restricted to the southeastern part of the lake. Any development around the wetlands must be supervised and executed in an eco-compatible manner. Unregulated tourism can impair the wetland's fragile eco-system in the future. With the present unregulated flow of tourists and lack of any drainage system, pollution levels of Tso Moriri and Tso Kar will increase in the near future (Mishra and Humbert-Droz 1998).

As the peak tourist season coincides with the breeding season of birds (when they are most vulnerable), there is all the more urgency to increase visitor's awareness about the delicate situation. Awareness literature should be given to all tourists on arrival. There is need to control reckless driving particularly around Tso Kar as it is damaging the vegetation and causing siltation of the lake. Leftovers in the form of plastic bottles and bags, tin cans, glass bottles, battery cells and other non-biodegradeable waste after each tourist visit at Tso Kar and Tso Moriri must be removed. Travel agencies' guides and drivers accompanying tourists should be made responsible to carry back their garbage to be disposed off in a non-polluting eco-friendly manner — not to be buried/burnt or left at the camping site. Guards should be stationed at all important sites to verify whether only designated camping sites are occupied, monitor activities of tourists and control littering and fine offenders.

All breeding and staging sites at designated wetlands need to be protected. As army and para military forces have a regular presence they should be updated about the ecological sensitivity of this area. They can play a major role in the conservation of the biodiversity of Ladakh. For example, ITBP camped at Korzok (Tso Moriri) can help in protecting the breeding Bar-headed Goose by safeguarding their breeding grounds. According to a WWF-India report they have helped in clearing the lake from time to time by removing garbage and waste dumped by the tourists around Tso Moriri (Chatterjee *et al.* 2002).

Recently erected electrical and telephone poles cutting through the Hanle marsh are a very serious threat to the flying Black-necked Crane. The poles need to be re-routed along the periphery of the marsh.

Religious leaders of Ladakh should be involved in conservation activities as they can help in motivating the local population. A good beginning was recently made by involving the head Lama of the Tso Moriri monastery in the conservation of the lake area (Chatterjee *et al.* 2002).

Certain areas such as the wetlands and marshes in Changthang should be kept inviolate, at least seasonally, during the breeding season. Staff of the Wildlife Department needs to be motivated and trained in wildlife management techniques. The wetlands should be monitored by the Forest Department and NGOs to curb disturbance and ensure breeding success of water-birds, especially key species such as the Black-necked Crane and Bar-headed Goose. The Changpas should be sensitized to their environment and even encouraged to pick up trash by offering monetary incentives. Some NGO could try this activity.

Feral dogs have to be culled at least around the marshes where their numbers are a direct menace to breeding Black-necked Crane and other marsh-dependent birds. Even sterilization can be attempted in view of the religious sentiments of the people. Defence personnel should be discouraged to keep dogs in large numbers.

The refugees settled at Hanle should be settled elsewhere. They have already encroached on the marsh within the Changthang Conservation Area and are rapidly expanding their economic activities.

The people of Ladakh are innately life respecting. They should not be prevented from using their traditional grazing grounds. It is not that wildlife cannot co-exist or breed where people are present. But they have to be taken into confidence (a long term on going exercise) and educated about their environment. They have also to be motivated to follow some basic rules. They should not allow domestic animals to wander in bogs unattended at least during the breeding season of the birds, and need to keep their dogs in check.

It must, however, be remembered that unless inhabitants of protected areas see some logical benefit especially in the long term, it would be difficult to convey the message of conservation and garner support. The management should not appear to be seen as solely concerned about the conservation of wildlife and habitat, which might not appeal to the local people, but also be concerned for their welfare. To accomplish this NGOs could have a role in bringing together scientists, management, administration, Army and ITBP and the local people. Only then can biological diversity be preserved by creating new protected areas and extension of existing ones in this region where low productivity and wildlife at low densities necessitate larger areas for protection of viable populations.

Systematic List of Birds

122 species recorded during June, July, August, and September are listed below. The account includes information on abundance, status, location, distribution and breeding. Previous notable records are briefly compared with our findings.

Abbreviations used

(Br.) – proof of breeding found. This refers to nests found with eggs or chicks or adults carrying nesting material

or food; with nidifugous species young seen or receiving parental care by adults.

* new record, species not previously reported from Ladakh.

? status uncertain

1. **Little Grebe** ***Tachybaptus ruficollis****

Vagrant. Three observed in summer plumage at Trishul Tso (*c.* 3500 m) near Leh on July 1; 1999. One individual again recorded on July 3, 1999. This represents the first record of the species for Ladakh. Moreover, the sighting represents an altitudinal record, considerably exceeding the highest altitude previously recorded for the species in the Subcontinent (Sangha *et al.* 2003).

2. **Great Crested Grebe** ***Podiceps cristatus***

Summer visitor. Br. Recorded nesting on ponds and lakes in Changthang. On July 25, 1999 at least nine breeding pairs observed at Startsapuk Tso (seven nests and four chicks). On August 30, 1999 one pair was observed followed by four grown up chicks at Tso Moriri near Korzok village. The chicks were independently diving for food. Pfister (2001) recorded breeding at Yoye Tso (4700 m) in June 1995 and September 1997.

3. **Little Cormorant** ***Phalacrocorax niger****

Vagrant. An adult observed repeatedly diving for fish in the murky water of the swollen Indus river on August 18, 2002 at Mahe, far to the north of its hitherto known distribution range in the Indian subcontinent (Sangha and Naoroji 2005). There is one more record of the species for Ladakh. Rouf Zargar, Wildlife Warden of Ladakh reported sighting of a bird from Shey fish-ponds in summer, 2001 (Otto Pfister pers. comm.).

4. **Bar-headed Goose** ***Anser indicus***

Summer visitor. Br. This near-threatened species is common on the fresh and brackish water lakes of Changthang and the upper Indus river up to Chumathang, increasingly uncommon in the west up to Leh. Absent further west. Colonies of breeding pairs were observed at Pangong Tso (one pair with three young birds on July 18, 1999) and Chushul (six breeding pairs including one with fledged chicks on July 19, 1999). Seven fledged young with adults were observed along the upper Indus near Mahe on July 25, 1999 and three pairs with chicks between Mahe and Nyoma on July 3, 2001. At Tso Moriri, the main breeding stronghold of the species in the Subcontinent, the birds are wary due to disturbance caused by spread of cultivation right up to the lake edge.

5. **Brahminy Duck** ***Tadorna ferruginea***

Summer visitor. Br. Apart from the regular sightings throughout the study area, a pair with two fledged young near Mirak on July 18, a pair with two chicks at Chushul on July 19, a pair with seven chicks at Hanle on July 23 and fifty five at Tso Kar, including four breeding pairs with chicks on July 25, were recorded in 1999. A pair and eight young were recorded at Hanle on June 30, 2001.

6. **Gadwall** ***Anas strepera***

Summer visitor, mainly passage migrant. Three were observed at Chushul on July 19, 1999 and eight at Hundar on August 20, 2000.

7. **Mallard** ***Anas platyrhynchos***

Summer visitor, mainly passage migrant. A drake on July 21, 2000 at Panamik and eight at Hanle on July 1, 2001.

8. **Northern Pintail** ***Anas acuta***

Summer visitor, mainly passage migrant. Four were seen on July 2, 1999 and three on September 1, 2000 at Trishul Tso.

9. **Garganey** ***Anas querquedula***

Summer visitor, mainly passage migrant. Eight on Pallu marsh (at the northern base of Khardung La) on August 18, fifteen at Lal Pahari on August 25, and sixteen at Hanle on August 26, 2000. Four on the Indus near Loma on August 18, 2002.

10. **Common Teal** ***Anas crecca***

Passage migrant. Ten recorded on August 15, 2002 at Hanle.

11. **Tufted Pochard** ***Aythya fuligula***

Summer visitor, mainly passage migrant. One at Trishul Tso on July 5, 1999.

12. **Common Merganser** ***Mergus merganser***

Resident, augmented by summer visitors. However, the summer visitors descend to lower altitudes in winter. The remnant resident population is confined to ice-free patches along the Indus. Mallon (1987) saw small parties (1-4) along the Indus and Zanskar rivers. Five on the Indus near Kidmang on August 25, 2000, twenty four on the Hanle river between Loma and Lal Pahari on August 25, 2000. Nineteen at Hanle on August 28, 2000 and sixteen on the Indus near Mahe on August 31, 2000 (HS and RKN).

13. **Black-shouldered Kite** ***Elanus caeruleus***

Rare Vagrant. The species also recorded by Pfister (2004). Both RKN and Pfister (2004) observed the species during

(August-September). Observed by RKN in the Chushul marshes in early September 1997. The species has once been observed at high altitude in Sikkim (Ganguli-Lachungpa 1990), well beyond its normal habitat and altitudinal range.

14. **Black Kite** ***Milvus migrans lineatus***

Summer visitor/Passage migrant. Br. A pair observed during May/June 1998 near Leh Bazaar breaking off twigs from a Poplar and disappearing from view (RKN). One sighting from Army Headquarters 3 Infantry Division, Leh on July 15, 1999. There is at least one record of a pair breeding in 2001 in Leh (Otto Pfister, pers comm.). This race has been observed during spring passage (Williams and Delany 1986).

15. **Bearded Vulture** ***Gypaetus barbatus***

Resident. Widespread throughout the study area. One nest with a single young observed near Chang La on July 17, 1999 at *c.* 5000 m. Another nest with a fledged young was located near Hanle in a steep valley on August 14, 2002 at *c.* 4500 m. It was lined with grass, rags, sheep and yak wool, goat hair, pieces of plastic and strips of cloth (some plucked from prayer flags). It also contained animal remains like bones, skin, skulls and intact legs and feet of domestic and wild ungulates. An adult was observed feeding red meat to the young and carrying large bones in the bill to the nest. Breeding season extends from November/December to July, occasionally up to mid August.

16. **Himalayan Griffon** ***Gyps himalayensis***

Resident, infrequent. Widespread throughout the study area in small numbers – usually two/three, sometimes up to five/eight.

17. **Upland buzzard** ***Buteo hemilasius***

Resident. Restricted only to Changthang and Rupshu in eastern Ladakh. Dependent on marshes and wetlands for food when breeding. All nests located were on rocky outcrops adjacent to marshes. An active nest was found on June 22, 1998 near Ponguk village, Hanle (Naoroji and Forsman 2001). Two nests containing near fully-fledged young were observed at Hanle on July 23, 1999. One active nest with almost fledged young was found at Puga on July 25, 1999. The species was seen at Chushul, between Chushul and Hanle, Lal Pahari, Hanle, Puga, Tso Kar and with highest incidence and sightings between Dungti and Demchok at regular intervals (three adult pairs, two single adults and two recently fledged young on August 11, 2002) along the Indus where habitat comprised a mix of marsh/fluvial flats and steep rocky outcrops.

18. **Golden Eagle** ***Aquila chrysaetos***

Resident. Widespread throughout the study area, but under pressure during the breeding season. Accessible nests are usually destroyed by shepherds who perceive the species as a threat to their lambs. Two active nests on cliffs with two downy young and almost fledged young were found at Ney in May 1998 and end June 1999 respectively, and between Hanle and Chumur at Lenak La on July 2, 2001. Breeding season in Ladakh extends from late February to early August. Nestling period is usually 65-70 days. Prey observed included young of Shapu *Ovis vignei* and Bharal *Pseudois nayaur*, Himalayan marmot *Marmota himalayana* and very occasionally lambs of domestic sheep.

19. **Common Kestrel** ***Falco tinnunculus***

Common summer visitor. Br. Widespread throughout Ladakh. Opportunistically breeds both on trees in the vicinity of human habitation and rock faces usually away from human habitation. A pair observed breeding in a disused Black-billed Magpie *Pica pica* nest on a Poplar in the Shambala Hotel compound in Leh during July 1999. In the absence of suitable trees, observed breeding on rock faces and cliffs in Nubra, Changthang and western Ladakh.

20. **Merlin** ***Falco columbarius***

Passage migrant and winter visitor. Although Mallon (1987) considered it a migrant and winter visitor in very small numbers, Williams and Delany (1986) found it overwintering in small numbers. Our two sightings indicate that it is also likely to summer. One female was recorded in Nubra valley at Hundar on August 21, 2000 and a male between Demchok and Dungti at Chakhukma Tso on August 13, 2002.

21. **Eurasian Hobby** ***Falco subbuteo***

Common summer visitor. Br. One near Ney on July 1, 1999, one near Tangtse on July 17, 1999, and one near Karu on July 4, 2001. Additionally, regularly sighted at Shey marsh, where as many as three were observed on June 24, 2001 hawking dragonflies. Regularly observed throughout the Hanle valley on all visits. Throughout Ladakh, more frequently observed in open river valleys and marshes. Pfister (2001) also regularly sighted this summer visitor at Shey marsh and below Rizong from 1994 to 1997. Osmaston (1927b) found a nest at Kargil on a Poplar tree, in the nest of a carrion crow *Corvus corone* from which he had previously removed eggs. May occasionally nest on cliffs.

22. **Saker** ***Falco cherrug***

Mainly Passage migrant, also winter visitor. Uncommon. Sightings during summer indicate the possibility of the

species occasionally breeding. In September 1997 one individual observed between Chushul and Tsaga village, one between Loma and Hanle, another en route to Korzok. One recorded in the valley between Hanle and Lenak La on July 28, 2000. Near south Dungti; one on June 28, 2001, two in August, 2002 and one in June, 2003. One observed in June 2003 at Hanle (RKN and Pankaj Sharma). Mallon (1987) considered it as passage migrant and winter visitor in very small numbers.

23. **Himalayan Snowcock** ***Tetraogallus himalayensis***

Resident. Found at high elevations in western and central Ladakh though not common.

24. **Chukor** ***Alectoris chukar***

Resident. Common. Widespread over most of Ladakh. Loose parties of up to 20 are not uncommon around village fields. A pair with six chicks was observed in a barley field near Ney on July 6, 1999. Another pair with eight chicks was observed near Karu on August 9, 2002.

25. **Tibetan Partridge** ***Perdix hodgsoniae***

Resident. Regularly sighted between Hanle and Lenak La in the Changthang. We observed one pair with nine chicks on August 28, 2000 along the Hanle/Chumur road. Osmaston (1927b) found it "not uncommon in Rupshu especially from Polokonka down the Puga valley".

26. **Black-necked Crane** ***Grus nigricollis***

Summer visitor. Br. Regular on the wetlands of Changthang, which are under various threats. While studying their breeding ecology in 1997 Pfister (2001) recorded 38 birds of which 24 were breeding (12 nests, 24 eggs incubated, 13 eggs hatched, and nine chicks fledged).

27. **Common Moorhen** ***Gallinula chloropus***

Passage migrant. One individual recorded at Trishul Tso on July 6, 1999, one at Diskit on August 28, 2000 and three at Shey marsh including a juvenile on August 23, 2000.

28. **Common Coot** ***Fulica atra***

Passage migrant and summer visitor. Six observed at Trishul Tso on September 1, 2000. Two recorded at Shey marsh on June 24 and another two at Trishul Tso on July 5, 2001.

29. **Pacific Golden Plover** ***Pluvialis fulva***

Passage migrant. Six observed feeding along the grassy shore of Tso Moriri near Korzok village on August 30, 2000. The birds were in 50%-70% breeding plumage. Pfister (2001) also recorded it during autumn passage.

30. **Lesser Sand Plover** ***Charadrius mongolus***

Summer visitor. Br. Common on fresh and brackish marshes of Changthang. Twenty recorded on July 18, 1999 near Mikar (Pangong Tso) including two pairs with chicks. Four birds in breeding plumage were observed at Pashmina Goat Farm at Khurl on July 21, 1999. Another three birds in breeding plumage were recorded at Hanle on July 22, 1999. Four individuals telescoped at Chakhukma Tso between Demchok and Dungti and a pair with two chicks between Dungti and Loma along the Indus on August 13, 2002.

31. **Common Snipe** ***Gallingo gallinago***

Passage migrant. Five flushed from the grassy patch on the edge of Tso Moriri, Korzok village on August 30, 2000.

32. **Eurasian Curlew** ***Numenius arquata***

Passage migrant. Two observed at Hanle on July 24, 1999 and two more at Tso Kar on July 25, 1999.

33. **Common Redshank** ***Tringa totanus***

Summer visitor. Br. Widespread and breeds in very small numbers. Two breeding pairs were observed at Chushul on July 19, 1999. The behaviour of the adults left no doubt about the presence of chicks. On June 28, 2001 two chicks were observed with adults who tried to guide us away along the Hanle river near Loma. Breeding reported from Tso Kar lake and Puga Valley (Osmaston 1927b), but these sites at present are quite disturbed.

34. **Common Greenshank** ***Tringa nebularia***

Passage migrant. Three at Chushul on July 21 and one at Tso Kar on July 25 in 1999. Five near Diskit on August 21, 2000. Three along the Indus near Dungti on August 11, 2002.

35. **Green Sandpiper** ***Tringa ochropus***

Passage migrant, though a few individuals recorded throughout winter and summer months. One at Hanle on July 23, 1999, four at Diskit and one on the lake near Panamik on August 21, 2000. One at Hanle on August 26, 2000 and two at Tso Moriri on August 30, 2000.

36. **Wood Sandpiper** ***Tringa glareola***

Passage migrant. One observed at Lal Pahari on July 24, 1999.

37. **Common Sandpiper** ***Actitis hypoleucos***

Passage migrant. One recorded at Mikar (Pangong Tso) on July 18, another at Pashmina Goat Farm, Khurl on July 21 in 1999, two at Diskit on August 21 and another on 30 August at Tso Moriri in 2000.

38. **Little Stint** ***Calidris minuta***

Passage migrant. Seven birds in breeding plumage observed on a small wetland near Hunder on August 20, two at Hanle on August 26 and three at Tso Moriri on August 30, 2000.

39. **Temminck's Stint** ***Calidris temminckii***

Passage migrant. One at Demchok on August 13 and another at Loma on August 18 in 2002. Williams and Delany (1985) found it to be the commonest wader on autumn migration.

40. **Curlew Sandpiper** ***Calidris ferruginea***

Passage migrant. Rare to occasional. One recorded at Pangong Tso in full breeding plumage on August 18, 1999. Also recorded from other areas of Ladakh by other observers (Otto Pfister, pers comm.).

41. **Black-winged Stilt** ***Himantopus himantopus***

Passage migrant. Three at Tangtse on July 17, 1999, twenty two at North Pullu, a small lake at the base of Khardung La on August 19, 2000, two at Sumur on August 21, 2000, four at Hanle on August 26, 2000 and two along the Indus near Dungti on August 10, 2002.

42. **Pallas's Gull** ***Larus ichthyaetus***

Passage migrant. Two sightings on the Indus; one at Loma on August 25, 2000 and five near Demchok on August 13, 2002.

43. **Brown-headed Gull** ***Larus brunnicephalus***

Summer visitor. Br. Regular on the lakes in Changthang where it breeds. Commonly seen in the wetlands and along the Indus. More than forty at Pangong Tso on July 18 and sixty three at Tso Kar on July 25, 1999.

44. **Black-headed Gull** ***Larus ridibundus***

Passage migrant/summer visitor. One record of over sixty individuals on July 25, 1999 at Tso Kar. Sighted occasionally by Pfister (2001) during September and October 1997.

45. **Common Tern** ***Sterna hirundo***

Summer visitor. Br. Regularly seen on the lakes and the Indus river in groups of not more than three to four.

46. **White-winged Black Tern** ***Chlidonias leucopterus***

Passage migrant. One adult in partial breeding plumage and one juvenile observed hunting at Trishul Tso on September 9, 2000. Pfister (2001) recorded one at Startsapuk Tso/Tso Kar on June 23, 1995.

47. **Tibetan Sandgrouse** ***Syrrhaptes tibetanus***

Resident. Thirteen observed on July 22, 1999 but only two on June 28, 2000 at Pongo village, Hanle. On both occasions the birds were confiding and we observed them from merely four metres. Pfister (2001) recorded the species around Tso Kar, Chushul, Hanle and Lam Tso/Chumur. A pair of downy newly hatched chicks observed by Osmaston (1927b) near Tso Moriri on June 18. Five Tibetan Sandgrouse believed to be breeding were seen at Taglang La at *c*. 4500 m (Robson 1993).

48. **Blue Rock Pigeon** ***Columba livia***

Resident. Common and widespread including Leh.

49. **Hill Pigeon** ***Columba rupestris***

Resident. Common and widespread. Frequently in the company of the Blue Rock Pigeon.

50. **Snow Pigeon** ***Columba leuconota***

Resident. Two birds observed near Ney on July 8, 1999.

51. **Oriental Turtle Dove** ***Streptopelia orientalis***

Summer visitor. Br. Frequently encountered near cultivated areas and in tree-covered valley basins of Ladakh, including Nubra.

52. **Eurasian Collared Dove** ***Streptopelia decaocto***

Vagrant. This plains species was observed in cultivation area Nimu on July 3, 1999. Not recorded for Ladakh by Ali and Ripley (1981) and Grimmett *et al*. (1998). Kazmierczak and van Perlo (2000) mention only one passage record. Pfister (2004) found it to be a late spring occasional passage migrant with a few individuals over-summering in western Ladakh.

53. **Common Cuckoo** ***Cuculus canorus***

Passage migrant. One near Leh on August 18 and another near Kiari on August 31, 2000. Both sightings near cultivated areas/plantations. Recorded by Pfister (2001) at Hanle and in the Nubra valley.

54. **Eurasian Eagle-Owl** ***Bubo bubo***

Resident. Widespread and not uncommon. A pair with nestlings at Lal Pahari on July 21, 1999. One adult with two nestlings observed at Puga on July 25, 1999. A solitary adult on a rock cliff near Hundar on August 20, 2000 was the first record for Nubra valley. One roosting on the rocks near Hanle monastery on July 1, 2001. Another seen flying near Dungti on August 11, 2002 and two near Lal Pahari on August 16, 2002.

55. **Little Owl** ***Athene noctua***

Resident. Locally not uncommon. All sightings between Hanle and Lenak La at three different locations on the Hanle/ Chumur road. Pfister (2001) recorded it along the northern and eastern rocky slopes of Tso Kar plains, in the upper Indus valley and near Chang La at 5000 m.

56. **Alpine Swift** ***Tachymarptis melba***

Summer visitor?/passage migrant. Two at Loma on August 10 and two at Dungti on August 13, 2002.

57. **Common Swift** ***Apus apus***

Summer visitor. Br.? Three on July 4 and 12, 1999 near Ney, a single at Panamik on August 21, 2000.

58. **Small Blue Kingfisher** ***Alcedo atthis***

Summer visitor. One individual regularly seen at Chushul (4450 m) from July 18-20, 1999, exceeding the highest altitude of 4240 m previously recorded for this species in the Indian subcontinent (Pfister 2001) The species has been recorded from three other sites - Nubra valley, vicinity of Indus near Shey and Hanle (Pfister 2001).

59. **Common Hoopoe** ***Upupa epops***

Summer visitor and passage migrant. Br. Widespread breeder throughout the study area including Leh. Up to ten observed at foraging sites.

60. **Long-billed Calandra-Lark** ***Melanocorypha maxima***

Summer visitor. Br. Two birds; one calling with cocked tail near the Hanle observatory on June 28, 2001. Pfister (2001) found active nests in June at Hanle and flocks of up to 30 individuals at Chumur in mid-August, 1997. One record from the Markha valley, 4 km south-west of Spituk on August 2, 2002 constitutes the most westerly record to date (Robson 2003).

61. **Hume's Short-toed Lark** ***Calandrella acutirostris***

Summer visitor. Br. Widespread and very common. An active nest observed at Saspol on July 6; three nests near Tangtse; and another containing three chicks near Mikir on July 18 in 1999. Nesting observed in early September 2000, possibly extending the known breeding period (Sangha 2001).

62. **Horned Lark** ***Eremophila alpestris***

Resident and summer visitor. Found in both small parties and large flocks. Two nests located on open ground with hardly any vegetation near Hanle on June 30, 2001. The outer rim of one of the nests was lined with tiny pebbles and contained two nestlings. Another nest was lined with sheep/ goat wool and contained two eggs café-au-lait in colour peppered with small dark spots.

63. **Pale Martin** ***Riparia diluta***

Summer visitor. Br.? One recorded at Demchok on August 12, 2002.

64. **Eurasian Crag Martin** ***Hirundo rupestris***

Summer visitor. Br. Three chicks in a nest on a rock face observed being fed by adults near Rumbak on July 6, 2001.

65. **Common Swallow** ***Hirundo rustica***

Summer visitor?/passage migrant. A single between Sumur and Panamik on August 21, 2000. Flocks of over 300 birds 'built up' during cloudy weather in late August 1981 (Williams and Delany 1986).

66. **Northern House-Martin** ***Delichon urbica***

Summer visitor. Br. Occasional sightings mostly along the Indus, maximum being four at Kiari on August 31, 2000.

67. **White Wagtail** ***Motacilla alba***

Summer visitor. Br. A common summer visitor and passage migrant in the study area. In autumn large movements of the species have been noted (Williams and Delany 1986). Also recorded in winter (Mallon 1987). Early spring passage consists mainly of race *M.a. personata*, a rare breeder in Ladakh (Williams and Delany 1986).

68. **Large Pied Wagtail** ***Motacilla maderaspatensis****

Vagrant. Two birds observed along the Indus near Likir (*c.* 3000 m) on July 7, 1999. A new record for Ladakh, extending the species' known distribution range further north and considerably increasing its known altitudinal range of 2200 m (Sangha and Naoroji in press). There is an additional record by Anne Brooks from Rumbak on July 20, 2000 (Otto Pfister, pers.comm.).

69. **Citrine Wagtail** ***Motacilla citreola***

Summer visitor. Br. We observed more than ten nests in thorny bushes not more than 0.61-0.92 m above the ground near Ney on August 8, 1999. Adults are very vocal when feeding nestlings. One adult seen carrying food on August 18, 1999 at Mirak (Pangong Tso). Early spring passage consists mainly of *M.c. citreola*, a non-local race (Williams and Delany 1986).

70. **Yellow Wagtail** ***Motacilla flava***

Summer visitor. Br? The least common among the

wagtails in the study area. Breeds in Ladakh (Pfister 2001). The races *M.f. beema* and *M.f. thunbergi* appear during spring passage (Williams and Delany 1986).

71. **Grey Wagtail** ***Motacilla cinerea***

Summer visitor. Br. Occasionally seen in the marshes, swamps or rivers and lake-side mudflats.

72. **Eurasian Tree Pipit** ***Anthus trivialis***

Passage migrant. Three birds near Mahe September 2, 2000. Occasional sightings by Pfister (2001) during September 1997.

73. **Water Pipit** ***Anthus spinoletta***

Passage migrant. One bird along the Indus near Loma on June 28, 2001. Pfister recorded one at the northern spring of Tso Kar in September 1994, one in the Tangtse valley in June 1996 and more than five in the Shey marsh in March 2000 (Otto Pfister, pers. comm.). Also recorded by Williams and Delany (1986) during autumn.

74. **Grey-backed Shrike** ***Lanius tephronotus***

Summer visitor. Br. One near Tso Moriri on August 29, 2000. Another in a plantation near Pongo village in Hanle valley on August 15, 2002.

75. **White-throated Dipper** ***Cinclus cinclus***

Resident. Single adults observed; one perched on a rock overlooking the stream near Sumdo on August 31, 2000, another at Charding Nullah near the Hot Springs, Demchok on August 12, 2002. Adult observed feeding two just fledged chicks, incessantly begging for food at a stream opposite Mahe bridge check point on August 10 and 18, 2002.

76. **Brown Dipper** ***Cinclus pallasii***

Resident. Commoner than the previous species. Unlike the White-throated not recorded east of Mahe.

77. **Robin Accentor** ***Prunella rubeculoides***

Resident. Very frequently seen affecting scrubs and bushes along river valley bottoms and villages, often preferring wet areas throughout Ladakh.

78. **Brown Accentor** ***Prunella fulvescens***

Resident. Widespread, affecting trees and bushes in remote mountain valleys, but less common than the previous species.

79. **Blue Rock-Thrush** ***Monticola solitarius***

Summer visitor. Br. Widespread throughout Ladakh. A juvenile observed close to Hundar on August 20, 2000 and near the observatory at Hanle on August 15, 2002.

80. **Blue Whistling-Thrush** ***Myiophonus caeruleus***

Summer visitor. Br. A single at Rumbak on July 8, 2001. Otto Pfister (pers. comm.) found a nest in the Hundar gorge in 1997.

81. **Eurasian Blackbird** ***Turdus merula***

Passage migrant. One dead bird was found at the base of Lenak La on Hanle/ Chumur road. One female seen on 1 and 2 October, 1997 below Hanle monastery during autumn migration (Pfister 2001).

82. **Himalayan Rubythroat** ***Luscinia pectoralis***

Summer visitor. Br. A pair observed feeding two chicks at Chushul on 19 and 20 July 1999. The nest was in a *caragana* bush about one metre above the ground. Two sightings in 2000 – one on August 29 at Tso Moriri and another on August 31 near Sumdo. At Demchok one observed in bushes along the Indus on August 12, 2002.

83. **Bluethroat** ***Luscinia svecica***

Summer visitor. Br. One at Tso Moriri near Korzok on August 30, 2000. Singles at Rumbak on July 8, 2001 and Demchok on August 12, 2002.

84. **Black Redstart** ***Phoenicurus ochruros***

Summer visitor. Br. Widespread, common. Two chicks were observed being fed by adults on July 1, 1999. The nest was in a crevice of a stone boundary wall at Nimu.

85. **Guldenstadt's Redstart** ***Phoenicurus erythrogaster***

Resident. Widespread and common throughout the study area. Abundant in winter when the summer population is swollen by winter visitors (Mallon 1987).

86. **White-capped Redstart** ***Chaimarrornis leucocephalus***

Summer visitor. Br? One to three birds regularly seen at Ney (June 30-July 8), one at the base of Chang La, another at Chagar Tso (between Tangtse and Pangong Tso), two-three at Chushul (July19-21) in 1999. One to two birds regularly seen around Rumbak in early July, 2001. Not recorded at Hanle, Chumur, and Demchok. Our sightings at Chushul are far east of its known summer distribution range.

87. **Grandala** ***Grandala coelicolor***

Summer visitor. Recorded from two sites. Two to three were regular at Ney from 3-12 July, 1999. A female observed picking insects by flying close to the contours of rocky slopes

close to the Indo-Tibetan Border Police camp at Hanle on August 14, 2002.

88. **Common Stonechat** ***Saxicola torquata***

Passage migrant. An early autumn migrant observed while driving from Chushul to Loma on July 21, 1999. One observed in September 1997 near Diskit in the Nubra valley (Pfister 2001).

89. **Pied Wheatear** ***Oenanthe pleschanka***

Summer visitor. Br. A pair observed feeding chicks near Nimu on July 3, 1999. The nest was located in a culvert under the road in the gap between boulders used for support. This record confirms that the species breeds in Ladakh.

90. **Desert Wheatear** ***Oenanthe deserti***

Summer visitor. Br. Widespread and very common throughout the study area.

91. **Blyth's Reed-Warbler** ***Acrocephalus dumetorum***

Passage migrant. One individual was recorded at Korzok on August 30, 2000. Otto Pfister (pers. comm.) reported it from Nubra valley in September.

92. **Common Chiffchaff** ***Phylloscopus collybita***

Summer visitor. Two at Hanle on July 24, 1999 and two at Trishul Tso on September 3, 2000.

93. **Moutain Chiffchaff** ***Phylloscopus sindianus***

Summer visitor. Br. Widespread and commoner than the previous species. Smaller numbers seen in Changthang than Nubra and areas west of Leh. At least 4-5 active nests found with adults feeding nestlings near Ney on July 8, 1999.

94. **Olivaceous Leaf-Warbler** ***Phylloscopus griseolus***

Summer visitor. Br. Rather common and observed breeding at Ney from 3-12 July, 1999. Also recorded occasionally at Leh (including Trishul Tso) and Nubra. In Changthang, it was not uncommon in trees and thickets. At Sumdo, a family of three to four juveniles and adults were observed on August 31, 2000. At the army outpost at Demchok, daily counts of 4-8 birds seen on 11 and 12 August 2002 represent an eastern extension of its range in Ladakh.

95. **Common Lesser Whitethroat** ***Sylvia curruca***

Summer visitor. Many sightings from different areas including Leh. One at Ney on July 5 and two at Likir on July 6, 1999; three at Diskit on August 20 and six at Sumur on August 21, 2000. One at Karu on June 24 and two at Chumathang on June 27, 2001. Otto Pfister (pers. comm.) found an active nest in a small buckthorn bush near the Indus at Shey in June 1995.

96. **Tickell's Warbler** ***Phylloscopus affinis***

Summer visitor. Br. Not uncommon throughout our surveys in suitable areas with shrubbery, bushes and trees.

97. **Spotted Flycatcher** ***Muscicapa striata***

Passage migrant. All sightings during autumn. One observed on a Willow at Leh on September 2, 2000. Adults observed in early September in the Nubra valley (Otto Pfister, pers. comm.).

98. **Great Tit** ***Parus major***

Resident. Widespread and not uncommon in the Indus valley plantations and other patches of trees. Not recorded in Changthang.

99. **Wallcreeper** ***Tichodroma muraria***

Summer visitor. Br. A pair seen near Kiari on August 25; five including three trailing juveniles between Gaik and Kiari on August 31 along the Indus river in 2000. A pair were again seen near Kiari on August 18, 2002. Recorded from Rumbak in June 1996; Hundar gorge in Nubra valley and Sumdo near Puga in September 1997 (Otto Pfister, pers. comm.). Osmaston (1927a) observed breeding birds in June and July in the Gya Valley, also near Tankse and Khardong.

100. **Fire-fronted Serin** ***Serinus pusillus***

Resident. Widespread and locally common in the study area except Changthang. However, recorded once at Chumur in Changthang in the compound of the Indo-Tibetan Border Police in early August, 1997 (Otto Pfister, pers. comm.). Found in small flocks of up to 10 birds.

101. **Twite** ***Carduelis flavirostris***

Resident. Widespread and common in sandy and rocky areas. Immense flocks (well over 150 birds) seen while driving from Dungti to Tyagarmale on the afternoon of July 28, 2001.

102. **Hodgson's Mountain-Finch** ***Leucosticte nemoricola***

? Occasionally seen throughout the study area. Resident according to Pfister (2001) but Mallon (1987) recorded it only during the winter of 1983-1984, but was unclear whether the species was previously overlooked in other winters or normally leaves the area.

103. **Black-headed Mountain-Finch** ***Leucosticte brandti***

Resident. All sightings east of Leh usually in small numbers on desolate open stony ground, high altitude cliffs,

crags and barren mountaintops. Otto Pfister (pers. comm.) recorded it on all visits in the upper Rumbak valley. More than 25 sighted near Nyoma on June 26, 2001. Literally hundreds seen between Dungti and Tyagarmale on July 28, 2001.

104. **Mongolian Finch** ***Bucanetes mongolicus***

Resident. Occasionally seen throughout the study area. Williams and Delany (1986) found it quite common during spring. Pfister (2001) observed fledged young being fed by the adults during August.

105. **Common Rosefinch** ***Carpodacus erythrinus***

Summer visitor. Br. Common throughout the area in plantations, orchards, and thickets except Changthang. Two birds seen by us at Hanle on July 1, 2001 represent an eastern extension of its range in Ladakh. The recent Willow plantations probably account for the species' range extension.

106. **Streaked Great Rosefinch** ***Carpodacus rubicilloides***

Resident. Sighted only in Changthang. Not uncommon on rocky slopes, scree and plateaux. Occasionally found around army camps/settlements.

107. **Common Great Rosefinch** ***Carpodacus rubicilla***

Resident. Not uncommon. However, rather localized and in smaller numbers than the previous species. Two active and one abandoned nest were found in unoccupied army barracks at Loma in August 2002 (Sangha and Naoroji 2004).

108. **House Sparrow** ***Passer domesticus***

Resident. Quite common around human settlements and plantations in small groups and large flocks. One active nest (adults feeding nestlings) was located in the hollow of a Willow at Diskit on August 20, 2000. At Leh in early September, the ripe wheat crop attracts huge flocks.

109. **Tibetan Snowfinch** ***Montifringilla adamsi***

Resident. Widespread and common in the study area. Near Zingral (*c.* 4800 m) at least nine nests observed on the rocky slopes along the road in 1999. One located near Ney, below the road in the gap between boulders used to build a culvert. It is common around settlements, army and ITBP camps in Changthang.

110. **Rufous-necked Snowfinch** ***Pyrgilauda ruficollis****

Vagrant. Two birds observed on June 23, 2001 at More plains. This represents the first record of the species for Ladakh.

111. **Plain-backed Snowfinch** ***Pyrgilauda blanfordi***

Summer visitor. Br. Locally uncommon in dry sandy areas with stunted vegetation. More than ten birds observed feeding at the northern base of Lenak La on August 16, 2002. Pfister (2001) observed breeding in Pika *Ochotona* burrows and recorded three fledged young in early July 1996. At least five (including a pair feeding young in a nest) were seen near Taglang La on 30 June and 1 July (Robson 1993).

112. **Brahminy Starling** ***Sturnus pagodarum***

? Three observed in Willow plantations of the forest department at Nyoma on June 27, 2001. Pfister (2001) recorded it in early October 1997 at Hanle. The species has been recorded by others as vagrant on various occasions (Otto Pfister, pers. comm.). Williams and Delany (1986) reported it as 'very occasional' during November.

113. **Rosy Starling** ***Sturnus roseus***

Passage migrant. A flock of more than 200 restless juveniles observed between Sumur and Panamik on August 21, 2000. They were feeding on small black berries growing on extensive stands of buckthorn. Eleven were picking insects from a wheat field at Hanle on August 28, 2000. Juveniles observed in Tso Kar by late August and a good number (including a flock of more than 15) in the Nubra valley mostly around Diskit and between Sumur and Panamik (Otto Pfister, pers. comm.)

114. **Eurasian Golden Oriole** ***Oriolus oriolus***

Summer visitor. Br. A pair on July 15, 1999 and another single on September 1, 2000 in Leh. One record also from Changthang (Pfister 2001).

115. **Black Drongo** ***Dicrurus macrocercus***

Vagrant. Encountered only once near Nimu in crop fields on July 1, 1999. Also recorded from Mahe in July. An exhausted individual in the western Hanle plains in October 1997 (Pfister 2001).

116. **Black-billed Magpie** ***Pica pica***

Resident. Widespread and common throughout area surveyed. In western Changthang seen along the Indus up to Chumathang; vagrant further east. Five birds were sighted at Tangtse on July 18, 1999. In eastern Changthang, observed by RKN between 1998 and 1999 once between Mahe and Nyoma and once at Hanle. Observed once at Chushul on 9 June, 1996 (Otto Pfister, pers. comm.)

117. **Hume's Groundpecker** ***Pseudopodoces humilis***

Summer visitor. Br. Occasional in Changthang. However, relatively common and confiding at Hanle, Hanle/Chumur road,

and Chumur. On July 22, 1999 near Pongo, Hanle, five fledged young observed near a stream following adults and begging for food. Five fledged young being fed by adults observed on August 28, 2000 along a verdant valley on Chumur road. Another adult observed taking a dip in the stream and preening. Approaching Chumur on July 1, 2001, two adults were observed digging for larvae on humid grassy bank of a stream.

118. **Red-billed Chough** ***Pyrrhocorax pyrrhocorax***

Resident. Widespread and common throughout the study area. At least four nests located on July 23, 1999 in crevices/holes of the rocky foundations of the Hanle *gompa* (monastery). Osmaston (1927a) found 40 nests located in holes in a sandy cliff near Leh. A flock of more than 150 birds flying to their roost was sighted at Hanle on July 23, 1999.

119. **Yellow-billed Chough** ***Pyrrhocorax graculus***

Resident. Widespread and common throughout the study area but fewer than the previous species.

120. **House Crow** ***Corvus splendens***

Vagrant. Sighted on few occasions in Ladakh during summer of 2001. The observation at Hanle (4240 m) on June 29, 2001 represents the highest altitudinal record for this lowland species (Sangha and Naoroji 2003).

121. **Jungle Crow** ***Corvus macrorhynchos***

? One at Leh on August 24, 2000. Resident mainly in western Ladakh according to Pfister (pers. comm.).

122. **Common Raven** ***Corvus corax***

Resident. Widespread and common throughout the study area — in the mountains, high passes, remote valleys, around villages/towns including Leh. Up to eight at Chumathang on August 25, 2000. Two perched quietly in falling snow at Tanglang La (*c.* 5250 m) on June 23, 2001. Three followed us from the base of Lenak La (*c.* 5000 m) to the top of the pass expecting leftover food on August 18, 2002.

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